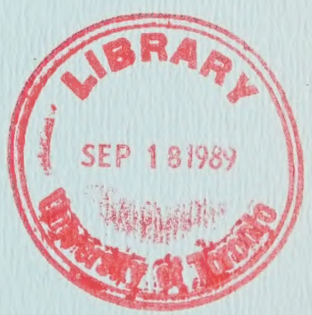
EA-87-02

ENVIRONMENTAL ASSESSMENT BOARD

VOLUME: 132

DATE: Friday, September 8th, 1989

BEFORE: M.I. JEFFERY, Q.C., Chairman
E. MARTEL, Member
A. KOVEN, Member



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EA-87-02

HEARING ON THE PROPOSAL BY THE MINISTRY OF NATURAL RESOURCES FOR A CLASS ENVIRONMENTAL ASSESSMENT FOR TIMBER MANAGEMENT ON CROWN LANDS IN ONTARIO

IN THE MATTER of the Environmental Assessment Act, R.S.O. 1980, c.140;

- and -

IN THE MATTER of the Class Environmental Assessment for Timber Management on Crown Lands in Ontario;

- and -

IN THE MATTER OF a Notice by the Honourable Jim Bradley, Minister of the Environment, requiring the Environmental Assessment Board to hold a hearing with respect to a Class Environmental Assessment (No. NR-AA-30) of an undertaking by the Ministry of Natural Resources for the activity of timber management on Crown Lands in Ontario.

Hearing held at the Ramada Prince Arthur Hotel, 17 North Cumberland St., Thunder Bay, Ontario, on Friday, September 8th, 1989, commencing at 8:00 a.m.

VOLUME 132

BEFORE:

MR. MICHAEL I. JEFFERY, Q.C.	Chairman
MR. ELIE MARTEL	Member
MRS. ANNE KOVEN	Member

A P P E A R A N C E S

MR. V. FREIDIN, Q.C.) MS. C. BLASTORAH) MS. K. MURPHY) MS. Y. HERSCHER)	MINISTRY OF NATURAL RESOURCES
MR. B. CAMPBELL) MS. J. SEABORN)	MINISTRY OF ENVIRONMENT
MR. R. TUER, Q.C.) MR. R. COSMAN) MS. E. CRONK) MR. P.R. CASSIDY)	ONTARIO FOREST INDUSTRY ASSOCIATION and ONTARIO LUMBER MANUFACTURERS' ASSOCIATION
MR. H. TURKSTRA	ENVIRONMENTAL ASSESSMENT BOARD
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MR. R. EDWARDS) MR. B. McKERCHER)	NORTHERN ONTARIO TOURIST OUTFITTERS ASSOCIATION

APPEARANCES: (Cont'd)

MR. L. GREENSPOON) MS. B. LLOYD)	NORTHWATCH
MR. J.W. ERICKSON, Q.C.) MR. B. BABCOCK)	RED LAKE-EAR FALLS JOINT MUNICIPAL COMMITTEE
MR. D. SCOTT) MR. J.S. TAYLOR)	NORTHWESTERN ONTARIO ASSOCIATED CHAMBERS OF COMMERCE
MR. J.W. HARBELL) MR. S.M. MAKUCH)	GREAT LAKES FOREST
MR. J. EBBS	ONTARIO PROFESSIONAL FORESTERS ASSOCIATION
MR. D. KING	VENTURE TOURISM ASSOCIATION OF ONTARIO
MR. D. COLBORNE	GRAND COUNCIL TREATY #3
MR. R. REILLY	ONTARIO METIS & ABORIGINAL ASSOCIATION
MR. H. GRAHAM	CANADIAN INSTITUTE OF FORESTRY (CENTRAL ONTARIO SECTION)
MR. G.J. KINLIN	DEPARTMENT OF JUSTICE
MR. S.J. STEPINAC	MINISTRY OF NORTHERN DEVELOPMENT & MINES
MR. M. COATES	ONTARIO FORESTRY ASSOCIATION
MR. P. ODORIZZI	BEARDMORE-LAKE NIPIGON WATCHDOG SOCIETY

APPEARANCES: (Cont'd)

MR. R.L. AXFORD	CANADIAN ASSOCIATION OF SINGLE INDUSTRY TOWNS
MR. M.O. EDWARDS	FORT FRANCES CHAMBER OF COMMERCE
MR. P.D. McCUTCHEON	GEORGE NIXON
MR. C. BRUNETTA	NORTHWESTERN ONTARIO TOURISM ASSOCIATION

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I N D E X O F E X H I B I T S

---Upon commencing at 8:05 a.m.

THE CHAIRMAN: Thank you. Be seated, please.

MS. MURPHY: I provided Mr. Mander with a list of exhibits, and I hope we don't have to refer to all of them. I also have one additional document that I'd be seeking to put in and I thought I might as well provide that now, although I won't be getting it to for some time.

It would probably be wise not to mark it until I actually get to it, but I thought I would give it to you at this stage. (handed)

THE CHAIRMAN: Thank you.

MS. MURPHY: And one comment off the record, if I could.

---Discussion off the record

PETER KINGSBURY,
LEONARD RITTER, Resumed

MS. MURPHY: I would like to begin with some discussion that took place yesterday with respect to buffer zones. And, as I say, I hope we don't have to refer to all of these documents, but I think if you have before you the following exhibits: Exhibit 798, which is an article by Echobichon and Walters: Health Concerns of Establishing Buffer Zones to Human

Habitation, that's Exhibit 798; Exhibit 800, that's the Evolution of Buffer Zones for Forest Insect Spraying in New Brunswick by Sexsmith; Exhibit 802, which is Buffer Zones for Main Spruce Budworm Suppression Operations by Oliveri; and finally Exhibit 803, a History of the Establishment of Guidelines for Buffer Zones for Aerial Application of Pesticides in Ontario Forests by Wanda Michalowicz.

RE-DIRECT EXAMINATION BY MS. MURPHY:

Q. Now, Mr. Kingsbury, Ms. Kleer was asking you a series of questions about these articles and about buffer zones in general. And you recall that discussion yesterday; do you?

MR. KINGSBURY: A. Yes.

Q. I wonder if you could clarify for me first the articles that we've just looked at, that list, they are all found in the proceedings of a particular workshop; is that right?

A. That's correct.

Q. And I understand that you -- that it was your evidence that you were involved in organizing that workshop; is that correct?

A. That's right.

Q. And can you advise whether there were other provinces or states also at the workshop?

A. Aside from those who made presentations?

Q. The ones that we have here are presentations about Maine, New Brunswick and Ontario. Were there presentations at that workshop given on behalf of any other provinces or states?

A. Yes, I believe there were presentations on behalf of Newfoundland, New Brunswick and Quebec.

Q. Thank you. Nova Scotia, I believe?

A. Nova Scotia, sorry.

Q. New Brunswick was one of the ones that we looked at. And can you clarify that that workshop happened in 1986; is that correct?

A. I think so. Just a second and I can give it to you. It happened in April of 1986, yes.

Q. Thank you. And one further point then. These articles, is it accurate to say that a series of individuals from various jurisdictions recounted the evolution, background and rationale for buffer zone policies in their jurisdiction for forestry applications?

A. That's correct. And each of these individuals came at it with a little bit more of a -- more or less history in terms of personal involvement

and more or less interaction with things like the environmental agencies within their own jurisdiction.

Q. Thank you. Now, what I would like to do, without attempting to go through these papers in detail, based on your knowledge of these papers and on the evidence you provided yesterday and on the fact that you attended the workshop, I'm going to ask you to take a pencil and make a list.

A. Okay.

Q. And when I'm finished with list, I'm going to ask you to advise me whether this is accurate, that this is a list of the factors--

A. Yes.

Q. --considered in each jurisdiction that influenced the original decisions about buffer sizes and in some, if indeed not all cases are also the factors that influenced subsequent changes to those buffers in each jurisdiction?

A. Yes.

Q. Okay. And the first item is products used.

A. Yes.

Q. The second, technology used.

A. Yes.

Q. And here I refer to, for example,

size of spray craft or types of application equipment. The third factor is data on drift dynamics.

A. Yes.

Q. The fourth, expected need for treatment.

A. Yes.

Q. The fifth, the expected magnitude or scale of treatment.

A. Yes.

Q. The sixth, assumptions about potential for human exposure.

A. Yes.

Q. Seventh, assumptions about natural environment risks.

A. Yes.

Q. And eighth, for want of a better term, a term that's used consistently, political considerations.

A. Yes.

Q. Now, I would ask you just to take a minute snd review that list bearing in mind the contents of the articles that were put to you and what happened at that conference, and advise whether any of those things I've listed, first of all, should be omitted, or whether anything else should be added to

that list as a summary of the factors in each jurisdiction influencing various decisions about buffer sizes?

THE CHAIRMAN: Ms. Murphy, while he is doing that, if I can interrupt, I have a document up here and I don't have any number on it. Could you tell me --

MS. MURPHY: You're probably not alone.

THE CHAIRMAN: Could you tell me what this is.

MS. CRONK: What's the title, sir?

THE CHAIRMAN: There is no title, it's page 23 to 26.

MS. CRONK: Exhibit 794.

THE CHAIRMAN: 794.

MS. CRONK: It begins:

"The panel is concerned..."

THE CHAIRMAN: That's right.

MS. CRONK: 794.

THE CHAIRMAN: Thank you.

MR. KINGSBURY: Having looked at that, Ms. Murphy, I would say that I believe that in each jurisdiction all of those things were in fact looked at.

The one thing I would say was -- would

perhaps be additional to that list, one might term whether you want to call it value or item of concern to be buffered was considered in each jurisdiction.

MS. MURPHY: Q. Thank you. Okay, if we can just look back at that list then for a minute and look at it in a little bit more detail.

MR. KINGSBURY: A. Yes.

Q. Looking at all of this material then, was it common for all jurisdictions to draw a distinction -- and I'm looking right now at products used.

A. Yes.

Q. Was it common for all jurisdictions to draw a distinction -- when setting buffer zones for insecticides to a draw distinction between BT and other insecticides?

A. It was very common, yes. It didn't -- it wasn't always reflected in a difference in buffer zone, but usually it was.

Q. Is that a reasonable thing do, in your view?

A. Very much so.

Q. The consideration of buffer size with respect to BT as distinct from other insecticides, was that consideration something that influenced the

original setting of buffers or, where buffers had changed, was that distinction considered in changing the sizes of buffers?

A. I think that distinction in most jurisdictions was recognized in both places. Sometimes originally there were differences and sometimes there were additional differences later on as the buffer zones evolved.

Q. So that's something that can be -- that in the actual factual situations here was, as you understand it, reconsidered at times when buffer zones were changed?

A. Yes.

Q. No. 2, with respect to technology used, is it your understanding from this material that the technology used is specific to each jurisdiction, that different jurisdictions use and tend to use historically different technology?

A. Absolutely.

Q. And is it common for agencies to consider in setting buffer zones the expected size of spray craft, for example?

A. Yes.

Q. And, again, is that understanding of what is expected to happen one of those things that is

reflected in the way a buffer is originally designed or the buffer is originally set or, again, is it one of those things that can be reconsidered or, in the factual situations before us, was reconsidered when buffers were changed?

A. Both of those are true.

Q. The next item was data on drift dynamics.

A. Yes.

Q. And you confirmed for me that some information on drift dynamics was considered in each jurisdiction?

A. Yes.

Q. Is an evolving understanding of drift dynamics ever a factor in setting original buffers or changing buffers?

A. Oh, yes.

Q. The next item was expected need for treatment. Again, is the expected need for treatment something that is fairly specific to each jurisdiction?

A. To each jurisdiction and, in many cases, historically to changes within a jurisdiction.

Q. Did the participants that wrote these articles and the other participants at the workshop base their understanding of their need for treatment in

their jurisdiction generally on historical data or on projections of need?

THE CHAIRMAN: Well, how could he tell that, Ms. Murphy?

MS. MURPHY: Well, if we can go to the papers and each paper has some discussion about what has been happening in the past, some papers deal with what they expect to happen in the future.

THE CHAIRMAN: Well, Mr. Kingsbury, what is your view based on the papers? I mean, you wouldn't know what the individual authors are thinking particularly.

MR. KINGSBURY: I think that in many jurisdictions my personal experience would give me some confidence to say that both of those things were taken into account, because very often the discussions around buffer zones, you know, are based on: Well, we came from here but what happens if in the future we go to there.

MS. MURHPY: Q. There are numerous examples I would cite, and we'll go to it in more detail, but Exhibit 803, for example, which is the paper by Ms. Michalowicz, points out that at the time that certain buffers - this is at page 37, I don't think you need to go to it at this time - but in 1985

when examining the buffers there was some concern about what would happen in the following year, for example, in treating areas near Thunder Bay and Timmins.

I would suggest that was a situation in which the people who were looking at buffers were considering potential need in the future.

MR. KINGSBURY: A. Yes.

Q. And, again, that would vary; would it not, from jurisdiction to jurisdiction?

A. Yes.

Q. And from the information in these papers can we also assume - and you've already suggested to me that this was true - that in each jurisdiction there were assumptions made about the expected magnitude or scale of treatment in the future?

A. Yes.

Q. And, again, can you tell from these papers whether the participants tended to base this on historical data or on projections?

A. It would be based on both, of course.

Q. With respect to the three jurisdictions that these papers deal with; Maine, New Brunswick and Ontario, from your information -- from the information in these papers and from your personal knowledge, how does the magnitude of treatment compare

as between these three jurisdictions?

A. The magnitude in Ontario has always been much smaller historically than in those other two jurisdictions.

Q. Are you able to give any idea of the magnitude of difference?

A. Certainly, the scale -- with the exception of 1984, I believe that it is safe to say that the spray program in Ontario was generally five to 10 per cent or less of that in those other two jurisdictions. There might be a year or two when it may have gotten a little bit bigger than that, but I don't think so.

Q. So it is a significant difference?

A. Very much so. It used to be a standing joke in places like New Brunswick that: Well, we went out today and sort of tested the systems and did more area than other jurisdictions, you know, did in a whole spray season.

Q. Well, that leads us to the next one which is assumptions about potential for human exposure. And, again, I would suggest to you that you've agreed already that that is one of the things that was considered by each of these jurisdictions?

A. Yes.

Q. Would you agree that the likelihood in each jurisdiction for the potential for human exposure is different?

A. Oh, absolutely.

Q. Is that at all linked to the previous comment you made about the magnitude or the scale of operations?

A. Yes.

Q. And would the magnitude or scale of operations have any effect on the probability of an aerial application for forestry purposes to take place in proximity to human habitation or muncipal water supplies?

A. Certainly.

Q. And if that probability was high and in situations where it was, did you see any specific reference to that in papers done by representatives of those jurisdictions?

A. Yes. This was something that was covered in some of the papers, was more or less the frequency of likelihood of repeated application on a yearly basis.

THE CHAIRMAN: Well, how does that necessarily follow, Mr. Kingsbury? I mean, couldn't you have a very small spray program but because of the

luck of the draw your spray is always near human habitation or near water supplies. I mean, it doesn't directly correlate, the size of the spray program with where the spraying is done; does it?

MR. KINGSBURY: But certainly when you're drawing comparisons between spray programs covering annual programs of several million hectares, plus there are comparisons between jurisdictions.

For instance, in a symposium that was held in Timmins a number of years ago some very interesting comparisons were made between, say, forestry in New Brunswick and Ontario that pointed out such things like in the Province of New Brunswick one can never be more than something like five miles from a forest access road which is, of course, very different than the situation in Ontario.

And quite a number of comparisons like that can be made that very much support the fact that in -- particularly in places like New Brunswick and Maine, forest spray programs historically and conceptually are much more closely related to the general populous. Some distribution of population as another example.

MS. MURPHY: Q. And drawing on that and in fact drawing on that and going to the next item, the

next item I had is assumptions about natural environment risk, but drawing on what you just said, if one can assume that natural environment risk includes, for example, risk to agricultural crops.

MR. KINGSBURY: A. Yes.

Q. All right. Would the potential be different from one jurisdiction to another based on exactly the same premise that you've just made?

A. Certainly.

Q. And in, for example, jurisdictions where there is a high probability of operations occurring near commercial blueberry fields, that may well be a consideration?

A. Yes.

Q. A very important one?

A. Yes.

Q. The next item I had was political considerations, and all of the papers I looked at used that term and you described what you meant by it. Would you agree that, again, that's an item that is different from jurisdiction to jurisdiction?

A. Yes, and year to year.

Q. Now, you added a ninth and, as I have it, you said we should also add item of concern to be buffered.

A. Yes.

Q. And is that also something that differs from jurisdiction to jurisdiction?

A. Absolutely.

Q. And can you expand on that?

A. Well, as a for instance, in many of the Maritime provinces estuary areas which may be important breeding grounds for marine fish might be an area of concern. That, of course, wouldn't apply in Ontario. There are many other examples, things like fish farms.

Q. Perhaps even those blueberry areas--

A. Yes.

Q. --farms or things like that?

A. Certainly.

Q. Things that are specific to jurisdictions. I see.

A. And they would, of course, be things that would be identified in the provincial permitting process.

Q. I had one sort of query before I finish this. In organizing that workshop, was it possible for you to draw on any body of knowledge that came from the design of buffers for aerial applications of pesticides in other uses than forestry, for example,

in agriculture?

A. There certainly is a body of knowledge regarding spray drift from agriculture. Buffers in agriculture are basically something that doesn't happen, that in agricultural situations there is a spraying to the limits of one's property almost without -- I'm not aware of any exceptions to that where in fact there are buffers applied in agricultural uses of pesticides.

Q. Notwithstanding that those may tend to take place close to human habitation?

A. Inevitably they do.

Q. And, Dr. Ritter, I understood your evidence to be that in those situations the people applying those pesticides have access to a much broader range of products as well; is that right?

DR. RITTER: A. That's correct.

Q. Taking you back to those nine factors -- nine variables then, Mr. Kingsbury.

MR. KINGSBURY: A. Yes.

Q. Taking those into consideration, can you comment on whether you are surprised to see variability in the specific results that arose from the consideration of those factors?

A. Not at all and, in fact, I would

point out that there would be even more variability present in those given that, as I made reference to the Board yesterday, there was one year in the Province of Quebec where, in my opinion - driven very much by political considerations - for one year buffers in the order of 10 kilometres for chemicals and one kilometre for BT were applied.

I think the fact that you will -- won't see that reflected in the report from Quebec perhaps suggests some embarrassment and a reconsideration between forestry and environmental agencies in that body following.

Q. This was an item you mentioned yesterday when you said that subsequently that was another situation where the buffers were changed?

A. Dramatically.

Q. Now, in these papers and at the workshop, can you advise, did all participants report changes in their buffer zones over time?

A. I believe that's correct, yes.

Q. And is it fair to say that those changes are reflective of changes in all of those factors that we discussed?

A. Oh, yes.

MR. MARTEL: Were they increased

primarily or were they decreased primarily?

MR. KINGSBURY: In the vast majority of situations they were decreased. There may be situations where new buffer restrictions were added, but certainly historically the tendency has been to decrease which is very consistent with a conservative policy of starting with something that you know is safe and as more data comes along that indicates not only is it safe but it's unnecessarily -- unnecessary and may be restrictive to an operation that you then, on the basis of further data and consideration, reduce that.

MS. MURPHY: Q. Would that be based on considerations, for example, of Item No. 4, expected need for treatment?

MR. KINGSBURY: A. In some situations very much so and tied into the expected need for treatment can be the values to be buffered.

I might just say that it is possible to at one time set a buffer on something that's considered a value, such as a camp site, and at another time to consider that that buffer in itself limits the ability to protect the value of the camp site. And this has in fact taken place where we can see, at different times, even within the same jurisdiction, a buffer to stay a certain distance away from a recreational use area and

at other times a reduction or elimination of that buffer because of the acknowledgment that really it's the protection of that aesthetics or recreational value of that resource that are important, and that requires direct treatment.

Q. Just drawing on Mr. Martel's question. First of all, I understand you to say that when it comes to the sizes of the buffers, given further information, there is a tendency to decrease them for various reasons?

A. Yes.

Q. You also pointed out that there are situations where new ones are added. Does that relate to your Item 9, items of concern to be buffered?

A. Yes, primarily.

Q. And with reference then to that issue about need and in fact your comments that you were just making -- you don't have this in front of you, I'm just going to read to you from Exhibit 799. This was a paper by Dr. Ecobichon, Aerial spraying of Fenitrothion in Forest Programs: some problems and solutions.

And you're familiar with that paper, I believe?

A. Yes.

Q. And just to read to you from page

1048, it can be found on the right-hand side of the page in the middle, Dr. Ecobichon states:

"...the Provincial Department of Natural Resources..."

This was New Brunswick:

"...arbitrarily established a 'buffer zone' of 1.0 mile (1600 m) from human habitation in which no spraying could be done. Leaving such a large area of untreated and infested forest (some 2 x 10(6) ha) to serve as loci for future generations of budworm moths would be unacceptable and unsatisfactory for overall forest protection."

Is that related or relevant to the comment you were just making about need?

A. Certainly.

THE CHAIRMAN: Ms. Murphy, I would like to address a question to Dr. Ritter.

Dr. Ritter, I am sort of intrigued by this comment that was made in terms of there being no buffer zones for agriculture -- agricultural spraying which obviously is very close to human habitation.

How do you reconcile that position? Given the products used in agriculture in an

agricultural setting, with the exception of trying to avoid spraying, for instance, near lakes and rivers and some of the aquatic areas, how do you reconcile that kind of approach dealing with human health with the forestry situation?

DR. RITTER: With the exception that you've noted, I don't think one can reconcile it. I think the establishment of buffers in the forestry setting - noting the exception to sensitive aquatic areas - is driven to a very large measure by public perception regarding the use of these products in public use areas and primarily only on that perception and political pressure.

THE CHAIRMAN: So there is really no scientific basis upon which to say: You spray in the forest setting where you're near habitation but not in the agricultural setting?

DR. RITTER: Well, in fact we can make the example to which you refer even more dramatic. You refer to the agricultural setting, and Mr. Kingsbury did that a moment ago. There is actually one which was much more dramatic, in my view, than that and that's the domestic situation. The use of chemical lawn care companies, for example, where we are not talking about agriculture where the proximity to human habitation may

or may not be relevantly close, so to speak.

In the urban setting, your having your lawn treated on a legal boundary which connects to your neighbour's, in that case proximity to human habitation would be measured in feet not in miles or kilometres, you may be within two feet of your neighbour and there are no restrictions on whether or not you can have your lawn treated or with what you can have your lawn treated.

So that I can't offer you a logical explanation. Quite frankly I am not sure there is one.

THE CHAIRMAN: And would this be borne out in terms of the human health impacts by the farm worker survey that is presently being produced that you referred to earlier?

DR. RITTER: In part. There are significant differences in the methods of application in the very situations that we are talking about and that certainly is a contributing factor.

The situations that we are describing here in forestry are invariably by air and one can argue that in the case of aerial application, the opportunity for off target drift is far greater than in the urban situation, for example, that I just described where it's all by ground. And in consideratio of that,

the establishment of buffer zones is not a bad idea.

MR. MARTIN: Can I raise just a matter with with respect to that, though. Has there not been a problem with trying to get the farming community, however, more carefully attuned - if I can use that terminology - to the dangers of pesticides or herbicides that they are using on their farms and that goes back for 10 or 12 years when people resisted even being involved in the Occupational Health and Safety Act, fought it like mad?

DR. RITTER: Yes.

MR. MARTEL: And now starting to realize that there might be some serious problems for them and that that is why maybe we have not had a feedback from the agricultural community, whereas it's occurred in other jurisdictions because they were working with it and accepted it.

DR. RITTER: Certainly there has been some efforts over the last few years to try to emphasize the potential hazards which may be associated with these chemicals, and I don't think there has been any single group in Canada, quite frankly, who has put in more effort and money, I might add, in that direction than we have.

We now sponsor a national TV advertising

campaign trying to advise primarily within agricultural communities of the potential hazards associated with the use of these chemicals but, notwithstanding, there are many, many more thousands of pounds used in agriculture and very often by air.

I don't want to leave you with the impression that agricultural application is restricted to ground, because that is simply incorrect and those applications, to the best of my knowledge, have virtually never been subjected to any buffer zone whatsoever.

The range of product, the frequency of use, the pounds applied, and the area treated are all invariably larger in agriculture than they are in forestry.

MR. MARTEL: I guess the only point I am trying to make is it seems to me there was a willingness to accept it in the agricultural community much more readily than maybe other areas.

DR. RITTER: I don't know, Mr. Martel, that there was more of a willingness to accept it, I think it is because if I spray my farm, it's my farm, and I really don't need your agreement to do it; whereas, if we are spraying a public area, a recreational area of the kind Mr. Kingsbury referred

to, or Crown lands which, for all practical purposes, are considered public, I think people quite legitimately feel that they do have a stake and that they have the opportunity to express a view about those sorts of programs, while that opportunity may not exist in the case of application to privately owned lands. And I think that has been the basis for consideration of buffer zones in public areas in contrast to their absence in privately held land.

But that is not a health consideration, that is simply a consideration based on whether or not you think you have to provide for that consideration.

MS. MURPHY: Q. And arising out of that, in contrast to the agricultural situation that you are discussing, would you agree that the regulatory and operational controls on forestry uses are considerable?

DR. RITTER: A. I think considerable quite frankly understates it. I think that there are orders of magnitude difference in the regulations imposed on forestry applications when compared to any other application in Canada.

By way of example, we spoke earlier during the course of testimony given by Mr. Kingsbury and myself, forestry applications by their very nature, by definition, are a restricted class regardless of the

product, and that has given us some anguish I might say in the case of BT, because the term restricted creates the impression that there is some intrinsic hazard where, in fact in the case of BT, the term has been used simply to denote a forestry application and doesn't in any way reflect a perception of hazard.

That automatic designation in forestry is true only for forestry. The very same product may often be used in a domestic setting and the product can be bought at Canadian Tire - if we talk about malathion or some of the other insecticides - you can buy that very same product at Canadian Tire in a totally unrestricted way, but if you buy it for application to a forest in Ontario, or indeed anywhere in Canada for that matter, there will be numerous levels of control which will be imposed on that application.

So I wouldn't say that they are more rigorous or the term that you used --

Q. Considerable I used.

A. I think that really understates it. I think, as I say, there are orders of magnitude difference in the way in which these applications are handled.

Q. Thank you. Then let's look at something specific. I would just ask you to take

Exhibit 803, that is the--

MR. KINGSBURY: A. Yes.

Q. --article by Ms. Michalowicz and if you go to page 40 there are a couple of things there I would like you to refer to.

Mr. Kingsbury, in her questions to you yesterday Ms. Kleer was asking you to provide the reasons, if you could, for the changes in the buffer zones that took place in Ontario in 1986.

I ask you, first of all, to look at page 40 and review the first two pararaphs and advise whether those two pararaphs explain the reasons for the change and the reasons and rationale for that change in 1986.

And once you have read it, rather than asking you to just comment, I would like you to just read it first.

A. Okay.

Q. And I would like to take you to the second sentence in the first part:

"The modifications in widths for buffer zones allow MNR's forestry spray program to be conducted uniformly in Ontario and provides for a realistic approach to the need for forest protection without

compromising designated areas that require protection from spray deposit."

And I will just go on:

"These guidelines were agreed to by both ministries and will be implemented for the 1986 spray season. It is believed that these parameters are rationale, workable throughout the province and enforceable by our regulatory body."

Now, with respect to that, first of all, is it your view that those two pararaphs assist at all in understanding the reasons for the change, the reasons and rationale for the change in that buffer?

A. Yes, certainly.

Q. It refers to need?

A. That's right.

Q. It refers to the item you dealt with earlier, the specific areas that require buffers?

A. Yes.

Q. And it adds, I would suggest to you and ask if you agree, another matter which is a regulatory concern on the part of the body that is regulating the activity?

A. That's right. If I might just comment. I feel that certainly in pesticide use

Ontario has had the opportunity to look at other jurisdictions and I think there has been excellent opportunity made use of the experience of other jurisdictions.

I think this is an example of that where in the field of buffer zones Ontario really has only had gone through two steps -- two stages; an initial stage like: What do we do recognizing we have got to do this now, and then one major adjustment.

That is certainly somewhat less contortion than other jurisdictions have gone through and I think it's based partly on learning from the experiences in other areas.

You made reference earlier in Dr. Ecobichon's paper to the application of a one-mile buffer zone restriction in the Province of New Brunswick. That application was put in place for many years and I believe that there is a rather extensive body of knowledge showing the cost of that policy in terms of quite a number of things.

Basically what happened was a great deal of that one-mile restriction encompassed private woodlots which had historically been protected from budworm infestation, that much of that property over the period this buffer zone restriction was in place

suffered heavy budworm mortality with some rather significant impacts in terms of both losses of fiber and also the fact that these private woodlots were often a very major source of income for a large segment of the population that was tied to the land perhaps doing some farming and also getting some income from their private woodlots.

That policy was subsequently changed in New Brunswick. A lot of money was spent trying to salvage dead timber from those areas and a great effort went into spray programs trying to protect them with small agricultural aircraft in subsequent years.

The fact is that a policy changed, and there was a lot of fallout because the policy had been in place for many years that; one, the policy is now recognized as being unnecessarily conservative, and it had some dramatic ramifications at a lot of levels, certainly forestry, but also even at the social level in terms of impacting on a traditional lifestyle for many people where they would cut wood from their private woodlots and it was an integral part of their economy.

THE CHAIRMAN: Mr. Kingsbury, in the second paragraph it talks about -- on page 40, it talks about workable throughout the province and enforceable

by our regulatory body.

MR. KINGSBURY: Yes.

THE CHAIRMAN: Why would it make a difference as to the enforceability of whether a buffer is a thousand metres or 200 metres? I mean, if you are going to prohibit spraying outside of a particular buffer zone and monitor that, what does the size of the buffer zone have to do with making it more enforceable?

MR. KINGSBURY: I believe there, when it says enforceable by the regulatory body, part of that means that the regulatory body can basically defend the application of that buffer zone to the public; whereas it is rather indefensible saying: Well, we have got one buffer zone for human habitation in this area and a different one in a different place. And I believe that that -- basically the enforceability is referring there to the ability of the regulatory agency--

THE CHAIRMAN: To rationalize.

MR. KINGSBURY: --to rationalize the policy.

THE CHAIRMAN: It has nothing to do with a difference in ability to monitor or to enforce in terms of ensuring that those spraying adhere to the buffer zone, whatever that distance is?

MR. KINGSBURY: That would be my

interpretation.

MS. MURPHY: Q. Well, I am going to ask you to think about that further, because I am going to ask you to, on the same page, look at the last paragraph where Ms. Michalowicz is talking about the kind of things that this regulatory body is involved in in attempting to enforce their regulations.

Would you look at that as well and then we will read it.

MR. KINGSBURY: A. Okay.

Q. Ms. Michalowicz says:

"The guidelines have been formulated to minimize inconsistencies of assessment in the review of aerial permits by MOE pesticide control officers to provide MNR field staff with a basis on which to plan spray blocks for permit approval and to seek a balance between the use of pesticides and protection of the environment and human health."

Now, Ms. Michalowicz is advising that MOE pesticide control officers who are located across the province, as you know--

A. Yes.

Q. --receive requests for permit. There

has been evidence already before the Board that the permits are provided along with a great deal of documentation that sets out what the plan will be and Ms. Michalowicz is pointing out that this allows MNR staff the basis upon which to put that together and to ask for permit approval.

Is it conceivable that that as well is part of the ability to, or the enforceability of the regulatory body?

A. Yes, and I would see that as perhaps what I was trying to spell out, also capturing that aspect of it.

THE CHAIRMAN: Well, what does distance have to do with that? I mean, if you are going to put together a permit for a thousand foot buffer zone or a 240-foot buffer zone or metre, what difference does the distance have with the documentation that would be required to support that and the maps showing the spray blocks, et cetera? What is the big difference in terms of distance?

MS. MURPHY: Q. If I might, Mr. Chairman, is the issue here the size or the consistency?

MR. KINGSBURY: A. I would say the issue is the consistency, and I would agree that if the

agency set a different distance than when they did, it would still not contradict the fact that it would be a more enforceable policy.

Q. Now, Ms. Kleer was asking you about some of the specific items that were found in papers from other jurisdictions. In particular, there was some discussion about protection of municipal water supplies. Do you recall that?

A. Yes.

Q. And you recall that it was pointed out that there is a comment about municipal water supplies, for example, in the Ontario documentation as well?

A. That's correct.

Q. If you look again at page 40, and I will ask you to look at the third paragraph.

A. Yes.

Q. And also the sixth paragraph.

A. Yes.

Q. Again, this addresses the item you raised earlier about specific things that should be buffered; is that right?

A. Yes.

Q. And Ms. Michalowicz says:

"The guidelines, while being applicable

to the majority of forestry spray applications, will not be used in specific applications requiring detailed analysis such as areas adjacent to registered bee yards or municipal water supplies. These situations will be considered and discussed on an individual basis as has been done in the past."

A. That's right.

Q. And, again, in the other paragraph I pointed out to you, Ms. Michalowicz discusses what happens in atypical situations.

Is it your understanding that again these are details that are assessed on a case-by-case basis?

A. Absolutely, in that the permit issued by MOE would be -- would reflect that.

Q. And finally I would like you to look at the last paragraph on that page.

A. Yes.

Q. I had asked you earlier whether the people at the workshop commented on the potential for future changes in buffers. Ms. Michalowicz says:

"MOE pesticide control staff will continue to review and modify the guidelines for buffer zones as new

literature and data become available. MOE will meet and continue to discuss with MNR any future pesticides and any changes in pesticide application technology that may affect both the forestry spray program and the requirements for buffer zones."

Is this similar, or is this one of the comments by one of these individuals at this workshop that indicates that these things are evolving?

A. Yes.

Q. Dr. Ritter, yesterday - and in fact this was raised earlier by the Chairman - one of the items that was on the list that we were discussing is assumptions about potential for human exposure.

And in her questions yesterday Ms. Kleer asked you some further questions about the potential for adverse health effects from direct overspray of human beings with certain forestry pesticides. You recall that?

DR. RITTER: A. Yes.

Q. You responded that it would be difficult to imagine any situation where a bystander could be exposed to a higher level than a worker. Do I have that right?

A. That's correct.

Q. You also advised that this particular set of circumstances, this particular hypothesis has been modeled?

A. That's correct.

Q. Is that something that was done in a way similar to the photographs, for example, that you showed us in your evidence-in-chief where exposure was monitored?

A. Similar, but not identical to, yes.

Q. And have you made reference to those specific studies where those exposures have been monitored?

A. I refer to the work which Dr. Ecobichon has published and references contained therein; Crabbe, for example, with the National Research Council who has published similar kinds of work and others.

Q. In response to questions by Ms. Cronk you agreed with her and with the Crump document that the highest level of exposure expected for forestry workers is experienced by handlers in the aerial application sense and by backpack sprayers in the ground application sense; is that correct?

A. That's correct.

Q. And perhaps this is repeating in another way a question that was raised to you earlier by the Chairman, but I am going to ask you: If the provincial regulatory agencies were to set buffer zones on the basis of potential adverse human health effects alone, no other considerations involved, what size buffer zone would you recommend?

A. It's difficult to give you a precise answer without specific consideration of the given chemical and conditions of application, so on and so forth, but I would venture to say that in many cases they would be substantially less than they are now.

At the distances which Dr. Ecobichon, for example, used to model his estimates of exposure, as I indicated yesterday in what is now Exhibit 799, using the buffers, as Dr. Ecobichon has in this paper, he estimates that the margin may be as large as 20,000. Now, obviously that is an unnecessary margin.

Q. That was the margin of safety in that paper?

A. So to speak. It was the difference between the anticipated level of exposure and that level which produced minimal effects experimentally, and that produced a margin -- I can refer you specifically to --

Q. Page 1050 at the bottom on the right, 20,500-fold lower?

A. That's correct. And that is at the distances buffered in this particular case. Obviously, one could use a buffer zone which would be substantially less than this and still achieve margins of safety which might still be in the order of several thousand fold, which I think most people would consider more than adequate.

So, in summary, I think I would say that it would be reasonable to presume that if they were based on public health concerns alone, they would, I suspect in many cases, be much smaller than they are.

THE CHAIRMAN: Smaller than the Ontario context or smaller than New Brunswick or which jurisdiction are you talking about?

DR. RITTER: Smaller -- I am referring to the specific example. I think if one were talking about fenitrothion, as Dr. Ecobichon has modelled it here, one could most certainly use, in this particular case, a buffer zone which is much smaller than what has been used in this model.

In the case of Ontario specifically, as I indicated in my response, one would have to look at the mathematics with regard to the specific application,

the chemical in question, the toxic end points involved, the type of application equipment, so on and so forth.

But, as a general case, the buffers that have been selected have been selected on the basis of distances which produce no effect; that is not to say that a distance half that would also not produce no effect.

THE CHAIRMAN: Okay. But having said all that, and excluding the specific applications like municipal water supplies or sensitive aquatic environments, are the buffer zones used by Ontario generally as set out in the table -- which is what, page 166?

MS. MURPHY: 166.

THE CHAIRMAN: As far as you are concerned, Dr. Ritter, are those distances in all cases from solely a human health impact perspective adequate?

DR. RITTER: It's difficult to answer the question specifically because the headings refer to chemicals in general and not specifically.

But in an attempt to answer your question, I would say yes. These buffer zones are not very large, 60 metres 120 metres. These are of the order of a few hundred feet.

THE CHAIRMAN: And yet those generally would be adequate?

DR. RITTER: Yes.

THE CHAIRMAN: From solely a human health perspective?

DR. RITTER: Yes.

THE CHAIRMAN: Not the political considerations or anything else?

DR. RITTER: Yes. Under the method of application used primarily by Ontario; small aircraft, early morning application when wind velocities are minimal, so on and so forth, there has been very little evidence of the kind of drift which would be of significance from a public health point of view with these kinds of buffers.

THE CHAIRMAN: But assuming you had drift of 7.5 kilometres, which was evidenced in some of these studies, suppose you had the situation where there was substantial drift and, therefore, presumably human exposure, the health studies indicate that notwithstanding in those situations where there would be human exposure to bystanders, it wouldn't be a problem--

DR. RITTER: That's correct.

THE CHAIRMAN: --from a human health

perspective.

DR. RITTER: That's correct. Where the off target drift is taking place with buffers of a variety of distances and the levels have actually been estimated, as in the Ecobichon work or in the Crabbe work, the levels present at those off target sites are minimal.

THE CHAIRMAN: And that is bearing in mind that it is ingested through the skin -- not ingested but absorbed through the skin?

DR. RITTER: Yes.

THE CHAIRMAN: And that would be the method that would cause the human health impact, if there was any?

DR. RITTER: That's correct.

THE CHAIRMAN: Which is a smaller percentage of whatever the residue is in the first place?

DR. RITTER: That's correct.

THE CHAIRMAN: Thank you.

MS. MURPHY: Q. You mentioned earlier when you were discussing this with the Chairman that - and I don't have your exact words I am afraid - but you said there is nothing wrong with taking reasonable attempts to further limit exposure; is that correct?

DR. RITTER: A. That's correct.

Q. And I believe you -- could you comment on that? I think you made comment about that earlier as well.

A. I am not sure of the context in which I made the comment.

Q. Well, leaving aside buffers then, which is one way of further limiting exposure, it's true that another way of further limiting exposure, particularly for workers, the various methods of industrial hygience in your words?

A. That's correct.

Q. And that is, in your view, a fairly important consideration?

A. That's correct. As a public health agency we would like to see potential exposure to these products in general, not only necessarily forestry products, but products in general reduced to an absolute minimum. We would like to see those exposures reduced as low as they can be achieved in consideration of the operational requirements of the use of the product, and that is certainly our operating objective, there is no question about that.

Q. And you have also explained on a number of occasions that in order to determine

potential effects one has to bear in mind the actual toxic potential and also exposure; is that right?

A. That's right.

Q. And I will go back to that in a minute, but right now I would like you to please look at Exhibit 761. This was a document that was shown to you by Mr. Castrilli.

A. Yes.

Q. Have you got that? This is a portion of a document that was prepared on behalf of the Ministry of the Environment and in that document the Ministry was looking at the profile of 2,4-D use and exposure in Ontario. Do you recall that document?

A. Yes, I do.

Q. And I would like to take you first over to Table 4.3. This was one of the tables that was discussed between you and Mr. Castrilli, you'll recall?

A. Yes, I do.

Q. Table 4.3 is two pages long. That table shows Ontario Ministry of Natural Resources employee statistics. Those are employees involved in forestry applications, as you'll recall?

A. Yes.

Q. And there are just a couple of things on this table that I would like you to verify. I

understand that in your evidence in your cross-examination you pointed out that some of the numbers here are averages of averages, but bearing that in mind, is it in your view a fair representation or does it appear to be a fair representation of the number of people from the Ministry of Natural Resources involved in these projects?

A. Yes.

Q. And does it appear to give a fair representation of how long those people were involved in that one year in applications projects?

A. Yes.

Q. And I think I would like you to look at the heading that says: Jobs Involved. Does that also indicate to you fairly clearly what those people were doing?

A. Yes.

Q. And if you'll look down that column, just starting at Blind River, for example, you will note that the people involved were a supervisor, mixer, radio operator, security.

A. Yes.

Q. If you go down to Wawa, for example, one person is indicated as being on road control.

A. Yes.

Q. And there are a number of people who are indicated as being involved in block security and so forth; correct?

A. Yes.

Q. I would like you then to go to page 29. At the top of the page, the fifth line down, the people doing the study report:

"Most employees wore disposable coveralls, rubber boots, gloves, (generally chemical resistant) and face shields or respirators as standard items".

Are those the kinds of things that you are thinking about when you are thinking about occupational hygiene?

A. Yes.

Q. And finally I would ask you to go to Table 4.6. This is one that Mr. Castrilli was raising with you with respect to the use of gloves.

If you look at the bottom it indicates that there were 99 workers in total reported on this table, of them - I think you agreed with Mr. Castrilli - 81 of them were reported as wearing gloves; is that right?

A. That's correct.

Q. Mr. Castrilli asked you if that was less than 99 and you agreed?

A. Yes.

Q. Do you recommend that the radio operator wear gloves?

A. No.

Q. Or that the person who is doing block security or driving on the road outside the block?

A. No. I think in subsequent discussion with Mr. Castrilli, on closer examination of the table, I pointed out that in fact there was 100 per cent compliance in those individuals who might reasonably be expected to be exposed.

In fact, I think it was the Chairman who perhaps pointed out that pilots wearing gloves were probably not a good idea.

Q. Well, the discussion about the pilots is with respect to a different table and, that's true, that was pointed out that the pilots on a different table would not wear gloves.

I'm asking you to look at the earlier table which reported the actual MNR employees on the ground--

A. Yes.

Q. --81 of 99 were reported as wearing

gloves, and I just wanted you to indicate that a large number or a significant number of those employees were not involved directly in the application at all?

A. That's correct.

Q. Thank you.

THE CHAIRMAN: Ms. Murphy, what's the status of this document? Was it ever accepted by the Ministry?

MS. MURPHY: The Ministry of the Environment?

THE CHAIRMAN: Yes. It has got that disclaimer on the front page, what does that all mean?

MS. MURPHY: My understanding, and subject to information from the Ministry of the Envrinnoment, it was just a contract let to Deloitt Haskins to provide information to the Ministry of the Environment, and Deloitt Haskins did a survey of a number of users of 2,4-D and provided the information that was requested.

---Discussion off the record

THE CHAIRMAN: Mr. Mander just advises me that I'm on the 11:15 plane. He assumed I was on the 11:40 plane. Is that going to cause you a real major problem?

MS. CRONK: Go.

MS. MURPHY: I was just going to ask for ten minutes. Okay. Well, we will carry on.

THE CHAIRMAN: Can we skip the break, or if you need the break fine, but...

MS. MURPHY: Well, why don't we go for a little while and see how things go.

THE CHAIRMAN: Okay.

MS. MURPHY: Q. Mr. Ritter -- Dr. Ritter.

DR. RITTER: A. Yes.

Q. Ms. Cronk was asking you some questions about the Crump document. There were a lot of questions about it - and I don't intend to go into it in detail - I just want to ask you a couple of questions.

Ms. Cronk asked you a series of questions about that study and you agreed with her that the study authors did a three-step analysis and that that included an exposure assessment, a hazard assessment and a characterization of risk?

A. That's correct.

Q. Now, in your evidence-in-chief you explained that the analysis of risk involves looking at toxicity and expected exposure?

A. That's correct.

Q. Can you compare the description of this assessment -- this method of assessing risk and the method of assessing risk you were discussing earlier?

A. They're the same.

Q. And is this one of the common ways of assessing risks for pesticide?

A. I think it's the only meaningful way.

Q. Is it in fact a scientific principle--

A. Yes, it is.

Q. --that risk can be derived by looking at toxicity as a function of the expected exposure?

A. Yes. Risk is a function of the hazard times exposure.

Q. If I look at studies, scientific studies that are dealing with pesticide use, should I be able -- in assessing any study, should I be able to tell which part of that equation or which parts of that equation the study is dealing with?

A. Yes.

Q. Would you agree that it is important to understand that principle of assessment of risk in order to make any kind of assessment of the risk of pesticides?

A. It's essential in determining the risk of exposure to any potentially toxic agent, a drug, an industrial contaminant, a pesticide. There can be no risk without exposure.

Q. Now, Mr. Castrilli reported -- referred you to a case, that was a case that happened in Texas, and he showed us two pieces, one of which was an endorsement and the second one a decision from the Court of Appeal level?

A. Yes.

Q. And when you reviewed that document it was your view - and I don't have unfortunately your exact words - but there was not sufficient scientific information there to enable you to comment on that at all?

A. That's correct.

Q. In your review could you tell whether or was there any discussion of the principle of risk assessment at all?

A. No, there was not. From the -- no, not on the basis of what I was provided with.

Q. I would like you to take out, if you have it, Exhibit 770. That's the report of another case that was filed by Ms. Crump, Palmer and Nova Scotia Forest Industries?

A. I don't.

Q. I won't be reading very much to you, so... You are familiar with that case?

A. Yes, I am.

MS. CRONK: Could you just give me the exhibit number again, please?

MS. MURPHY: I'm sorry, it's 770, I believe.

THE CHAIRMAN: We have copies up here.

MS. MURPHY: Q. All right. But you are personally familiar with what happened--

DR. RITTER: A. Yes, I am.

Q. --during that case?

A. Yes.

Q. To your knowledge was scientific evidence presented in this case?

A. Yes.

Q. By a number of experts?

A. Oh, yes.

Q. It went for some period of time?

A. Yes.

THE CHAIRMAN: Were you involved with that case, Dr. Ritter?

DR. RITTER: Yes. That's the Justice Nunn decision you are referring to?

MS. MURPHY: That's right.

THE CHAIRMAN: Were you a witness in that case?

DR. RITTER: I was not a witness, one of my staff was at that particular case, but I was certainly involved over a period of time very directly.

MS. MURPHY: Q. Can you advise whether the principles of risk assessment were discussed in that case, and did Mr. Justice Nunn have the benefit of hearing that evidence?

DR. RITTER: A. Yes. In fact, I would say that some of the leading authorities in the world in the area of risk assessment were called to testify for a number of different interest groups in that particular hearing, yes.

Q. And I don't -- the case is quite long and has a lot of scientific information in it, but I was interested in that assessment of risk and I would just ask you to comment on one paragraph.

I'm not certain whether my copy of it -- mine I think is from a different report, but it's the paragraph numbered paragraph 5.9.9.

MS. MURPHY: Are your paragraphs numbered, Mr. Chairman?

THE CHAIRMAN: Yes.

MS. MURPHY: All right. It should be right near the end.

Q. This is towards the end of the case and, again, I'm referring to this because I'm interested in the risk assessment criteria that were discussed:

"I need not consider..."

Says Mr. Justice Nunn:

"...whether any particular area need be sprayed, whether other substances should be used, or whether manual release is a better approach."

These were the issues that were before him:

"While considerable evidence was adduced in this regard, it is not the court's function to direct how the defendant should manage its affairs or carry out its activities."

Oh, that's not the paragraph I was looking for. This obviously has -- I am looking for the risk one, sorry, 5.9.3 - it's clearly the wrong one, Mr. Chairman - this is the part where he is discussing risk:

"Having reached this point it is

appropriate to add that the evidence of risk assessment clearly indicates that any risk here in Nova Scotia, if indeed there is a risk at all, is infinitesimally small and many, many times less than 1:1,000,000 which level apparently is regarded as a safe and acceptable risk by most of the world's regulatory agencies. Putting this in perspective, as indicated by Dr. Wilson in his evidence, the risk of cancer to a smoker is 1:800 and for a non-smoker continuously in the same room with smokers it is 1:100,000, while the risk to a person drinking 2 litres of water per day from a stream immediately after being sprayed, which will not happen with buffer zones, is 1:100,000,000 or 100,000 times less than 1:1,000,000 which itself is regarded as a diminimus risk."

I believe in your evidence you have referred to Mr. Justice Nunn making a comment of that nature?

A. That's correct.

Q. And this comment was made after understanding the principles of risk assessment; is that right?

A. That's correct. The principle -- the philosophy of risk assessment, the methods used to calculate were the subject of rather extensive examination during the course of that trial. That was initially an injunction hearing and subsequently went to trial and it was, as I say, the subject of rather extended discussions at the trial.

Q. And this particular -- as I understood it, this particular case came up earlier and you were asked whether, subsequent to that case, any regulatory action was taken as a result of that case.

Knowing what happened in that case, would any regulatory action have been contemplated at all as a result of that case?

A. None whatsoever.

MR. MARTEL: Can I just ask one question. The evidence then and the evidence now with respect to secondhand smoking is considerably different; isn't it, that secondhand smoke is a much greater risk than five years ago that people thought was the case?

DR. RITTER: I think the -- I'm not sure that the number would be exactly as it was estimated

then, but the difference between the risk to the smoker when compared to the non-smoker in a smoking room I think is still more or less the same.

MR. MARTEL: It doesn't affect the numbers.

MS. MURPHY: Q. As a matter of fact, is that one of the areas you are dealing with right now, Dr. Ritter?

DR. RITTER: A. I have the pleasure of being responsible for the Tobacco Products Control Act.

MS. MURPHY: I read that with some pain myself--

MR. MARTEL: Did you.

MS. MURPHY: --Mr. Martel, but decided to read it to you anyway.

MR. MARTEL: Thank you.

THE CHAIRMAN: They have a strange way of numbering the pages in that decision. The top goes 354A and the next page is 353, and yet the paragraphs seem to follow from each other.

MS. MURPHY: I think -- my version is from the National Report and yours is probably from a different reporting service.

MS. CRONK: I would have to check the photocopy for you, sir, it's possible it was our error.

THE CHAIRMAN: No, but the paragraphs seem to follow on in the right sequence.

MS. CRONK: Then I take no responsibility for the clerical inefficiency of the Nova Scotia Justice system.

MS. MURPHY: Or Butterworths.

Q. Okay. Mr. Kingsbury, I'm going to ask you to put before you three exhibits. Again, I don't know that we will have to refer to them in detail -- actually four, but it is probably wise to get them. The first is Exhibit 792.

MR. KINGSBURY: A. Yes.

Q. That's a paper by Gibbs, Persistence of Carbaryl in Woodland Ponds.

A. Yes. 793?

A. Yes.

Q. Courtemanch and Gibbs, Short- and Long-Term Effects of Forest Spraying of Carbaryl on Stream Invertebrates.

A. I have it.

Q. 795, that's by Hunter and Witham, Effects of a Carbaryl-Induced Depression in Invertebrate Abundance on the Growth and Behaviour of American Black Duck and Mallard Ducklings.

A. I have it.

Q. Then I would also ask you to take in hand your copy of the ESSA Report, Exhibit 604C.

A. Yes.

Q. All of these reports deal with the product carbaryl; is that right?

A. That's correct.

Q. Carbaryl is an insecticide; is that right?

A. Yes.

---Discussion off the record

MS. MURPHY: Were you considering taking a break, is that...

THE CHAIRMAN: No. No, sorry, we're...

MS. MURPHY: Q. Okay. These documents were with respect to carbaryl which is an insecticide. And that particular insecticide is used for killing insect larvae; is that right?

MR. KINGSBURY: A. That's correct.

Q. What similarities are there, if any, between insect larvae and pond and stream invertebrates?

A. They're basically related as insect groups.

Q. The invertebrates that they're talking about here are going to be insects; is that

right?

A. In most of them. The exception would be amphipods which are a closely related crustacean.

Q. Now, just to ensure that we both understand -- that we all understand what these papers deal with, the first one deals with the effects of carbaryl on macroinvertebrates in certain ponds under direct overspray situations; is that correct?

A. Yes. Directly oversprayed for experimental purposes.

Q. The second one deals with the effects of carbaryl on macroinvertebrates in certain forest streams under direct overspray conditions; is that correct?

A. Yes, and those direct overspray conditions are related to an operational spray program in Maine which took place I believe in the early 70s.

Q. So that the one that dealt with ponds was intentionally oversprayed for the purpose of doing the experiment?

A. Yes.

Q. And the second one, the stream, was sprayed in normal operations before buffer zones of a certain sort were required in Maine; is that it?

A. That's correct. That took place, the

spray, in 1976.

Q. The third document, Hunter and Witham, this document, if I'm right, follows on the preposition that if a stream -- if a pond of a certain sort is sprayed, if there is an effect - and in this case there was an effect on the macroinvertebrates--

A. Yes.

Q. --then the people who are doing this study looked at whether there was a subsequent effect on the growth and behaviour of black ducklings?

A. Black and mallard I believe.

Q. Black and mallard ducklings; is that right. That's what it's about?

A. Yes.

Q. Now, you explained in your evidence that you tend to do environmental toxicology studies in the species or in species that you would expect to be most sensitive?

A. Yes.

Q. And that's most sensitive to the product that you're looking at?

A. Yes.

Q. Does that provide any insight into why these scientists were studying the effecet of this insecticide on stream invertebrates?

A. It's one of the basic groups that one would anticipate sensitivity to broad spectrum chemical insecticides.

Q. So they were anticipating that this was a potential effect?

A. Yes.

Q. This was as a matter of logic?

A. Yes.

Q. The logic being that, if you use an insecticide you're not going to be very surprised if you have an effect on insects?

A. That's correct.

Q. Now, the first two studies that I referred to, the Gibbs, Mingo, Courtemanch, and the second one, Courtemanch and Gibbs, were both referred to in the ESSA Document; is that right?

A. That's correct.

Q. And the third one - you may need to check the bibliography - the third one, although it was not itself cited in the ESSA Document, a similar study by the same authors was cited in the study -- in the ESSA study dealing with the same subject matter?

A. That's correct. The reference in the ESSA Document would be to what was contained in annual reports of monitoring programs coming out from Maine.

Basically they could be considered an interim report which probably would have the same data, I anticipate in greater detail, more of the raw data present.

Q. Okay. I'm just going to ask you to look now at the ESSA Document and at the part that discussed some of these studies. Would you turn to page 86?

A. Yes, I'm there.

Q. The ESSA Document did report these studies and these potential effects; did it not?

A. Yes.

Q. And you indicated that one of the people in Maine who has done a fair amount of work with these products and in this matter is Joan Trial who was actually a participant in the ESSA exercise; is that correct?

A. That's correct. And not only that, but Ms. Trial has produced a bibliography which would review a great portion of this work carried out.

Q. Right. That was the review you referred to that I believe is listed on page 4 of the ESSA Document where a number of literature reviews that were relied on by the group were listed on that page so people could know where some of the background

information came from?

A. Yes.

Q. And Joan Trial's review is listed there?

A. Yes. And in that review one would find not only these papers, but a considerable number of other papers on this topic, some of which would simply be preliminary reports of material that would lead up to journal articles such as these.

Q. Just looking at page 86 then, there is only one full paragraph on that page, I would like you to look at that.

A. Yes.

Q. The first three sentences essentially report what was found in documents like the ones we have just looked at; is that correct?

A. Yes.

Q. The third one:

"In some instances prolonged (up to 3 years) population reductions and reduced leaf processing capability have been documented."

That's a reference to Trial; is that right?

A. Yes.

Q. The last sentence says: "Grantham, however, provides evidence that both headwater refugia and no-spray buffers provide stream invertebrates with a degree of protection from these effects."

Are you familiar with Grantham?

A. Yes.

Q. Can you explain what headwater refugia is?

A. Headwater refugia was a strategy utilized when Maine was into very large spray programs where there was an intentional buffering of the headwater portion of a stream which received a -- which was in close proximity to a large amount of spraying.

The idea being that where it was known that carbaryl had impacts on aquatic invertebrates, that if the headwater areas of that stream could be left unsprayed there would be a potential source of invertebrates to recolonize areas and, as I've mentioned a few times, this is a very natural phenomenon in streams where invertebrates drift downstream with the current. It's in fact one way in which they adjust their populations.

Q. That's one of the things I have found

difficult, is that there is drift and there is drift?

A. Float down the stream. We call it invertebrate drift, but it has nothing to do with spray drift.

Q. Now, Grantham then says that:

"...headwater refugia and no-spray buffers provide stream invertebrates with a degree of protection from these effects".

Do you agree with this conclusion?

A. Yes, I believe that the Grantham papers are consistent with that conclusion.

Q. Would you agree, Mr. Kingsbury, that if carbaryl is used that certain protective measures should be taken?

A. Yes, I would.

Q. I'm going to ask you to think about this. What restrictions would you recommend, with respect to environmental toxicology, in the event that carbaryl was to be used?

A. The restrictions that I think would be important with respect to aquatic invertebrates would be buffer zones along streams, such as the restrictions that are currently in place.

It is my belief that buffer zones of the

magnitude that are now in place will effectively reduce or eliminate effects on stream invertebrates. I would also suggest that where there are standing water ponds in areas with high acidity and coloured waters, that these sites in particular, and any water sources flowing into these sites, certainly be targeted for buffer zone restrictions perhaps of a similar magnitude or perhaps -- if there is some suggestion that they would receive waters from a considerable area, that they perhaps even have a somewhat greater buffer placed around them simply because they do provide potential long-term repositories for carbaryl.

Q. Thank you. Is that -- I've misunderstood you, is that the same idea as the headwater refugia idea?

A. It's the idea that a pond can receive inputs, pesticide inputs from receiving waters. I'm simply saying that looking at a specific aquatic system one should be aware of material that may enter directly and material that may be transported into the system, and both should be taken into consideration.

Q. Thank you.

MS. MURPHY: I'm going to ask for ten minutes at this time.

THE CHAIRMAN: Okay. Thank you.

---Recess taken at 9:35 a.m.

---On resuming at 9:50 a.m.

THE CHAIRMAN: Thank you. Be seated, please.

This can be off the record.

---Discussion off the record

MS. MURPHY: Q. All right. In the interest of expediency, Dr. Ritter, I am going to ask you to do a task while I talk to Dr. Kingsbury for a minute. If you would take Volume 125, please.

A. Yes.

Q. If you go over to page 20979.

A. Yes.

Q. You will see at the bottom of the page, starting at line 20, there is a question from the Chairman to you. I would like you to, on your own while I ask Mr. Kingsbury a question, read that and, if you could, over to page 20984 to line 7 on page 20984. Okay. We won't be long.

Mr. Kingsbury?

MR. KINGSBURY: A. Yes.

Q. Mr. Castrilli drew your attention to two studies. I am not going to ask you to pull them out, I don't think you need to have them in front of you, but they are the study by Folmar, F-o-l-m-a-r,

which is Exhibit 726.

A. Yes.

Q. And another one by Cervisi, that was Exhibit 727.

A. Yes.

Q. With reference first to the Folmar study, you agreed with the conclusion that technical glyphosate, that is the active ingredient, was considerably less toxic than the Roundup formulation or the Roundup surfactant to several species. Do you recall that?

A. Yes.

Q. Then with reference to the Cervisi study, you agreed with Mr. Castrilli that aquatic toxicity tests in Canada have verified that the surfactant in Roundup is the major toxic component of Roundup and that the surfactant is much more toxic than glyphosate to fish. Do you recall that evidence?

A. Yes.

Q. Now, in your evidence-in-chief you described a study in which you were involved that took place in British Columbia. Do you recall that discussion?

A. Yes.

Q. That study is called Carnation Creek;

right?

A. Yes.

Q. And the portion of the study that you were involved with is filed as Exhibit 712?

A. That's correct.

Q. You were looking, among other things, at glyphosate in that study; is that right?

A. That's correct.

Q. What similarities, if any, are there between the conclusions of the Folmar and Cervisi - the ones that we just discussed - and those of the Carnation Creek study that you were involved in?

A. The Carnation Creek study looked at glyphosate under overspray conditions in a coastal B.C. watershed. Basically, it demonstrated a lack of effect on aquatic invertebrates and it also demonstrated a very modest exposure, that when you took the toxicity data from things like Folmar and Cervisi in hand, demonstrated why no effect was seen nor in fact would any effect be expected. There simply wasn't sufficient exposure.

In fact, the toxic levels of the material that we -- that I was talking about and that I was -- the figures that we were talking about with Mr. Castrilli were several orders of magnitude higher than

the exposure measured in the Carnation Creek experiment, even when a small stream was directly oversprayed.

Q. And that was done on the assumption that the component of glyphosate that has a potential is the surfactant?

A. That's correct.

Q. You accepted that that was the potential; did you not?

A. Certainly.

Q. And, again, we were listening earlier to how one assesses risk. Is this similar to what does one look at toxicity potential and also exposure?

A. Absolutely.

Q. And so it's the exposure part of it that makes the difference in that study; is that right?

A. Yes.

Q. In his cross-examination Mr. Castrilli asked you about the meaning of the term LC-50.

A. Yes.

Q. He said:

"Can you confirm for me that the LC-50 is the concentration lethal to 50 per cent of the test organisms?"

And you responded:

"Under the conditions of the test."

A. Yes.

Q. Can you elaborate about what that means, under the conditions of the test, the LC-50 has some meaning that is relevant to the conditions of the test?

A. Certainly. In reporting an LC-50 there are conditions such as water quality, temperature, age and size of the species being tested, things like that that are an integral part in that many of these factors affect toxicity.

Q. And is it a measure over time?

A. Yes.

Q. And when you were giving your evidence-in-chief and explaining the Carnation Creek study you showed some graphs and you indicated at that time the orders of magnitude that would be required to show this effect actually happening in fact?

A. That's correct.

Q. And they were significant?

A. Yes.

Q. They were -- you described them as being through the top of this roof I think?

A. Yes.

Q. Dr. Ritter, have you had a chance to read those pages?

A. Yes.

MS. MURPHY: It might help -- do you have Volume 125?

THE CHAIRMAN: I don't believe so.

MS. MURPHY: All right. Then let's just try it this way.

Q. The Chairman asked you this question:

"Is there any type of study that is required today that you would consider pivotal to registration, in the sense that if it wasn't a requirement in earlier decades, in earlier decades the product might have been registered, but if that kind of study is not done today you wouldn't register the product? In other words, is there a definitive type of study that may not have caught earlier registrations?"

And you went on to describe the studies that are required today, and there was a discussion that ensued. And then at the end of the discussion, at page 20983 at the bottom, Mr. Castrilli took you back and said:

"During the course of your answers to the Chairman you said the core studies you identified in your testimony-in-chief would be important ones to consider in response to the Chairman's question."

And he listed mutagenicity, oncogenicity, chronic testing, teratology and multi-generation. I have a little difficulty following the discussion and I wonder if you can help me.

What did you understand the Chairman to mean when he asked you: What pivotal studies are required or what would you consider pivotal studies?

DR. RITTER: A. Simply stated, I think the Chairman's question was to determine if chemicals might have been registered historically which would not have been subjected to the kinds of studies which are required today and my answer to that was yes.

Q. But does your answer -- does what flows from your answer mean that the pivotal studies are all studies that are required today?

A. That's correct.

MS. MURPHY: Was that the import of the question, Mr. Chairman?

THE CHAIRMAN: Yes, I believe so. I just wanted to find out what the differences were between

stuff registered earlier before the kind of testing that is required today was in effect.

DR. RITTER: And that is the way I understood the question.

MS. MURPHY: All right, thank you.

Q. Dr. Ritter, Mr. Castrilli brought your attention to a letter, Exhibit 728 -- I don't think you need to look at it, Mr. Chairman. It was a letter that was published in Lancet, it dealt with certain observations made in Japan with respect to the surfactant in glyphosate. Do you recall that discussion?

DR. RITTER: A. Yes, I do.

Q. And you responded that the letter indicated that the surfactant was substantially more corrosive than the active ingredient?

A. That's correct.

Q. You went on to say:

"I would add anecdotally perhaps that there are less difficult ways to kill oneself?"

Could you explain why you made that observation?

A. Because in the Lancet letter, as I recall, the cases referred primarily to those people

who had intentionally ingested orally the material in question. That would be a rather painful experience, I would imagine.

The surfactant is a surface active agent and as is normally the chemistry of most surface active agents, these types of chemistries tend to be corrosive.

I can only speculate that the intent of the victims in this case was suicidal and really the off-the-cuff comment that I was offering rather flippantly was that if the intent was suicide there would be less painful ways to do it.

Q. That was an unexpected level of exposure; would you agree?

A. Well, yes. I think the point - I don't want to belabour this - but the point really I was trying to make to Mr. Castrilli at the time is that this agent is not intended for oral consumption and I think it proves nothing to establish that upon oral ingestion the agent may cause death.

Q. Now, I am going to ask you to actually look at two other studies that were provided to you by Mr. Castrilli.

First of all, Photodegradation of the Herbicide Glyphosate in Water, this is Exhibit 730 by

Lund-Hoie and together with it an Exhibit 731, an article by Rueppel, Metabolism and Degradation of Glyphosate in Soil and Water.

A. Yes.

Q. Mr. Castrilli asked you a series of questions about the metabolites of glyphosate and, in particular, one that is called AMPA. Do you recall that?

A. That's correct.

Q. And you agreed that AMPA is one of the metabolites of glyphosate; is that right?

A. Yes.

Q. I think you also agreed or indicated that a metabolite breaks down further and at some stage in this case may form further metabolite formaldehyde; is that right?

A. That's correct.

Q. If we could look first at the Lund-Hoie article, I just ask you to turn to the second to the last page, page 728.

The first full paragraph at the top of the page where this author says:

"It is accepted knowledge that AMPA is the principal metabolite of glyphosate in soil and that this metabolite is further

converted to formaldehyde."

Do you see that?

A. Yes.

Q. And the citation there is Rueppel; correct?

A. Yes.

Q. If you will turn to Rueppel, please, page 524. Can you find that?

A. Yes.

Q. I believe this is the comment made by Rueppel which is at the end of the first paragraph that begins on that page:

"Previous work and our studies with ninhydrin have established the biochemical and chemical bases respectively for converting to formaldehyde via formlyphosphonic acid."

A. Yes.

Q. That is what it says. Do I understand this correctly to mean that Rueppel is reporting that he has found the possibility of this happening?

A. Yes.

Q. Is he reporting an actual observation of this metabolite appearing?

A. I would need to review that paragraph a little more carefully I think before I would answer that.

Q. All right. Do you know whether Lund-Hoie did any independent work?

A. No, I don't.

Q. To your knowledge, have you seen any other paper that shows the verification of this possibility in a lab situation?

A. No.

Q. Now, let's just go back one minute then. You were explaining that the product breaks down, it becomes a metabolite, it then metabolizes further and you were agreeing that at some stage it may form a further metabolite, formaldehyde?

A. That's correct.

Q. My question is: Assuming that happens, what happens next?

A. Formaldehyde is a relatively simple chemical and I would imagine that it would be broken down still further and excreted as simple elements of carbon, hydrogen and oxygen.

Q. Can you advise: Is formaldehyde a metabolite of a great many naturally occurring compounds?

A. It would be an intermediate, yes.

Q. Can you provide any examples?

A. Not off the top of my head, but it would be expected to be a metabolite of a large number of -- it's a very simple molecule.

Q. Do you know whether it would be unusual to find that metabolite in human urine?

A. It would be common to find that metabolite in human urine, it occurs all the time.

Q. I would like you to take the Crump document in hand.

THE CHAIRMAN: What is the number?

MS. MURPHY: Exhibit 716, Mr. Chairman. It's the big document.

MS. CRONK: Bound black book, Mr. Chairman.

MS. MURPHY: Q. And I will ask you to turn to page 268. Okay. In addition - and unfortunately I forgot to put this one on my list for you, Mr. Chairman, but it will only take one second - Exhibit 723, Fate of Glyphosate in an Organ Forest System by Michael Newton.

DR. RITTER: A. Yes.

Q. Mr. Castrilli asked you -- I am first of all referring to Exhibit 723, the Fate of Glyphosate

by Newton?

A. Yes.

Q. Mr. Castrilli asked you some questions about this document and there was some discussion about the notes at the bottom of the table. We have numbered the pages of this document, and this table is found on page 5.

And if you will recall, there was some discussion between Mr. Castrilli, the Chairman, and both witnesses about the meaning of a comment about the ability to detect NNG. Do you recall that?

A. Yes.

Q. And there was some confusion about what that sentence under the table meant.

First of all, I would ask you to go to the abstract which is on the first page of that document and ask you to look at the last sentence in the abstract and tell whether that assists us in understanding the meaning of the comment under the table?

A. They say the same thing, but they say it differently and perhaps that is why the confusion was introduced.

The last sentence in the abstract and on the front page of the paper says that

n-nitrosoglyphosate was non-detectable. The footnote on what we have numbered page 5 of that paper, footnote to Table 2, indicates NNG was not found at a detection limit of 0.04 milligrams per kilo.

It is a convention in analytical chemistry to report the presence or absence of the component for which one is analysing to the limit of detection. And for the purpose of assessment -- risk assessment, one often presumes that it is present at the lower limit of detection if it cannot be detected; that is, one cannot say with absolute certainty that it's not present at a level less than one can detect.

So while it's accurate to say what Dr. Newton has said that he could not detect it, it is also accurate and proper for Dr. Newton to report, as he did on page 5, that what he really means by that is that he could not detect it at this pre-determined level of detection.

Q. That his method allowed him to look at; is that the idea?

A. Correct. What he's really saying by that sentence in that footnote is that it could be present at levels less than that but he was unable to detect it, given the method which he used.

Q. Thank you. Now, keeping that in mind

would you look at the Crump document at page 268, looking at the first two full pararaphs on that page.

A. Yes.

Q. Crump is dealing with the same - I don't know if it's an element or whatever it is - he's dealing with NNG; isn't he?

A. That's correct.

Q. And he's talking about this risk assessment and we have heard how the risk assessment was done and it did take into account the potential for risk of NNG; did it not?

A. That's correct. What Crump has done, as I just indicated with Newton, is he's actually presumed that it is present at the level of detection rather than presuming that it's absent and that is the convention.

Q. And he indicates that making the assumption that it is present, the worst case total oral exposure from ingestion of wild berries would be approximately 4.0 times 10 to the -7?

A. 4 in 10-million.

Q. 4 in 10-million.

A. I am sorry, that is exposure; that is not risk. 4 times 10 to the -7 milligrams. He then goes on to develop the risk from that.

Q. And he says what?

A. "The amount of n-nitrosoglyphosate in glyphosate at the expected exposure scenario would be negligible and not pose any health hazard."

Q. If you look at the last paragraph, did Crump also consider the further potential that NNG might, if ingested, become -- all right. The possibility that NNG may be formed by intestinal micro-organisms was also considered?

A. Yes.

Q. And would you explain what his comment on that one means?

A. Yes. I made that point I think during the initial discussion on this when Mr. Castrilli first raised the possibility of contaminants.

The parent chemical, as tested, provides all of the necessary opportunity for the expression of all possible contaminant effects because it is the parent compound that is being administered in the toxicology testing.

So that if the intestinal micro-organisms in humans were capable of converting glyphosate to a more potent contaminant, one would have expected that opportunity to express itself in the course of the

cancer study.

Given that those cancer studies were, for all practical purposes, negative in their outcome; that is, without effect, it is difficult to contemplate how that may have constituted a real risk.

That is really what Crump is saying. He's saying that the in situ design of the cancer studies provides opportunity for in situ expression of risk and that he need only -- one need only be concerned with the exogenous appearance of the contaminant.

Q. Exogenous?

A. The contaminant that may be formed in nature as opposed to the contaminant that may be formed by you or I once we are exposed to the parent compound.

Q. And that is why he's talking about after ingestion in that paragraph?

A. That's correct. If you were to eat blueberries which had been contaminated with the nitrosoglyphosate, this is what might happen. But you needn't be concerned if you're exposed to glyphosate, per se, because if you are capable of converting it to the nitroso contaminant the cancer study would have already addressed that possibility.

Q. Dr. Ritter, I am going to ask you to

take Volume 124, please.

A. Yes.

Q. Page 20868.

A. Yes.

Q. You will recall at this point in the proceeding that you were discussing a paper that had been written by Dr. Melvin Ruber. Do you recall that?

A. Yes, I do.

Q. And you were discussing the history behind that particular paper.

A. Yes.

Q. And you had explained what had happened -- to the best of your knowledge, what had happened after that paper was submitted to a particular journal; do you recall that?

A. Yes, I do.

Q. At page 20868 you pointed out that the EPA document that dealt with the same product made no reference to Dr. Ruber's study?

A. That's correct.

Q. And that the studies that they did refer to are very different?

A. That's correct.

Q. They are the same data but, am I right, that they are from the same data?

A. Same core studies; the conclusions reached were very different.

Q. And what had originally happened was that someone had drawn conclusions from this information, had submitted this to the EPA, Dr. Ruber, subsequently taking the same data, came to a different conclusion?

A. That's correct.

Q. And you were commenting that Dr. Ruber's conclusion was not referenced at this point in time by the EPA?

A. That's correct.

Q. And if you look at page 20868, at line 13, you point out:

"You might also wish to note, Mr. Castrilli, in reviewing this document tomorrow, that the date on the guidance document..."

That is the EPA document:

"...is 1988, almost two and a half years after Dr. Ruber's publication first appeared in the Journal of Toxicology and Environmental Health. So I would expect that the agency would have had ample time to have included any review of Dr.

Ruber's work that they felt appropriate and would have included any conclusions thereof."

A. Yes.

Q. You recall that. I have distributed a document, the title of which is: A Scientific Update of the Current Status of Tordon (Picloram) Herbicide. This document was -- is the product of the Pesticides Advisory Committee of the Ministry of the Environment and it's dated May, 1982. Have you had a chance to review that?

A. Yes.

Q. This document recounts pretty much this situation, what happened with Dr. Ruber's study; is that right?

A. Yes.

Q. And it indicates that the Ontario Ministry of the Environment was doing -- or the Pesticide Advisory Committee was concerned and decided to look into this matter itself; is that right?

A. That's right.

THE CHAIRMAN: Do you want to mark it, Ms. Murphy?

MS. MURPHY: Yes. Thank you.

THE CHAIRMAN: That will be Exhibit 806.

---EXHIBIT NO. 806: Article entitled: A Scientific Update of the Current Status of Tordon (Picloram) Herbicide, by the Pesticide Advisory Committee, Ministry of the Environment, dated May, 1982.

MS. MURPHY: Q. Would you just look at page 24, after the series -- the historical series of events is recounted. The last paragraph under Environmental Protection Agency (EPA) response. Would you read that paragraph and then advise whether that assists you with the comment you made?

DR. RITTER: A. "Private communications with EPA officials revealed that EPA pathologists re-examined the slides and confirmed the findings of the original NCI report. Questions were raised about the portion of the NCI study concerning the incidence of hepatic neoplastic nodules in female rats and the use of excessive doses of picloram which induced mortality before termination of the study and the use of pool controls. Dow Chemical (U.S.A.) is presently rerunning this part of the study with respect to female rats."

Q. Now, your comment on page 20868 was

that you thought perhaps EPA would have had an opportunity to review. Does this indicate that they in fact did?

A. Yes. At the time that I made the comment, I should perhaps simply indicate, in the interest of clarity, I was aware of reviews that which had taken place by EPA. I didn't say that directly because I could not verify to any form that that had actually taken place.

But I had firsthand knowledge that it had and the impression I was trying to impart here was that they could have, had they chosen to do so.

Q. Yes. All right. And they did?

A. And they did.

Q. Thank you.

MS. MURPHY: Those are all of my questions, Mr. Chairman, but I am going to want an extra 15 minutes some other time.

THE CHAIRMAN: Thank you very much.

Very well, ladies and gentlemen, we will adjourn until next week, Monday at one o'clock, and proceed through until Thursday.

And I remind you all again, the week after we are going to go to the new schedule and start on the Tuesday.

Thank you.

---Whereupon the hearing adjourned at 10:40 a.m., to be reconvened on Tuesday, September 11th, 1989, commencing at 1:00 p.m.